03-13-09

BEFORE THE PUBLIC UTILITIES COMMISSION

OF THE STATE OF HAWAII

- - - - In the Matter of - - - -	)	Docket No. 2008-0273
	)	
PUBLIC UTILITIES COMMISSION	)	
	)	
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	
	)	

SOPOGY

RESPONSES TO INFORMATION REQUESTS FROM

THE PUBLIC UTILITIES COMMISSION,

DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM,

AND THE HECO COMPANIES

AND

CERTIFICATE OF SERVICE

John N. Rei, VP
Sopogy Inc.
2660 Waiwai Loop
Honolulu, HI 96819

(808) 237-2402
jrei@sopogy.com

BEFORE THE PUBLIC UTILITES COMMISION
OF THE STATE OF HAWAII

- - - - In the Matter of - - - -	)	Docket No. 2008-0273
	)	
	)	
PUBLIC UTILITIES COMMISSION	)	
	)	
	)	
Instituting a Proceeding to Investigate the Implementation of Feed-in Tariffs	)	
	)	

SOPOGY

RESPONSES TO INFORMATION REQUESTS FROM

THE PUBLIC UTILITIES COMMISSION,

DEPARTMENT OF BUSINESS ECONOMIC DEVELOPMENT AND TOURISM,

AND THE HECO COMPANIES

Sopogy Inc. (Sopogy) respectfully offers its responses to information requests made by the Public Utilities Commission ("the Commission"), the State of Hawaii Department of Business Economic Development and Tourism ("DBEDT"), and Hawaiian Electric Company. Inc., Maui Electric Company Ltd. and the Hawaii Electric Light Company, Ltd. (collectively: HECO Companies).

Responses by Sopogy to IRs of Public Utilities Commission

PUC/SOPOGY-IR-59

On a $/kW basis, what interconnection costs have you experience or do you anticipate for solar PV and solar thermal projects in Hawaii? Please describe how these costs vary by location, technology, and system size.

Response: As with any power project, interconnection costs for solar thermal projects vary based on project size and proximity to adequate utility transmission and distribution infrastructure. Sopogy's target market for power generation is in the 1-20 MW range, a size that was chosen in part for the ability to use existing transmission and distribution lines to feed our system's power to standard utility grids. However, it is recognized that interconnection costs are likely to be higher on the outer islands where such projects would represent a larger proportion of the overall system load and hence more detailed studies might be required. As Sopogy has only one large scale power project installed in Hawaii it is difficult to provide general estimates for future interconnection costs within the state. Much will depend upon project size, location and the characteristics of the nearest interconnection point.

PUC/SOPOGY-IR-60

Based on your experience, how much more expensive in $/kW are solar modules in Hawaii than is typical in the mainland United States? Please describe such differences in detail. Is this difference changing or likely to persist?

Response: Sopogy's business model involves flat shipping of components to project site to minimize shipping costs, followed by assembly of the parabolic trough collectors on site. As such, collector costs in Hawaii are affected by both shipping and local labor costs and these costs are likely to persist over time. Given that Sopogy is still in the process of completing its first large scale project in Hawaii it is premature to make estimates for what future panel costs might be for subsequent projects. This data can be made available at a future date as required.

PUC/ SOPOGY-IR-61

Based on your experience, due to the cost of land, permitting and labor, how much more expensive on a $/kW basis, are solar PV and solar thermal systems in Hawaii to develop than is typical in the mainland United States? Please describe such differences in detail. Is this difference changing or likely to persist?

Response: Sopogy power generation projects involve large scale ground mounted systems, generally in the acres to 10's of acres range. Hawaii's high cost of land, therefore, has a significant impact on the overall cost of such a project. Hawaii's higher labor costs also add significantly to the costs for constructing such large solar fields. Such land and labor costs are likely to persist over time. Given the variety of pricing on land and labor throughout the different regions of the mainland United States, however, it is difficult to provide a general statement on how much more expensive it is to build a

project in Hawaii versus an unspecified location in the mainland.

PUC/ SOPOGY-IR-62

Please describe any environmental regulations, zoning ordinances, and other barriers to the development of solar PV or solar thermal systems on Oahu.

Response: The primary barriers to the rapid development of solar thermal electric systems on Oahu are: 1) zoning allowances for renewable energy projects, and 2) the long project development cycles encountered due to the current competitive bidding process used by the utility.

Responses by Sopogy to IRs of the HECO Companies

HECO/Sopogy-IR-1
Do you agree that in addition to achieving a greater level of renewable energy for the State, reliability, power quality and ratepayer impacts are important considerations that must be addressed as a part of any feed-in tariff (FIT) design? If not, please discuss why not.

Response: No. The feed-in tariff is meant to be an incentive structure to encourage the adoption of renewable energy systems as a gradual means to shift the energy mix away from carbon based fuels and toward a more sustainable approach. The economic benefits and costs to the public, including ratepayer impacts, of the feed-in tariff, as a price specification, need to be considered in relation to the economic benefits and costs to the public of the competitive bidding framework now in effect for specifying the price of renewable energy. Ratepayer impacts must also be considered within the larger issues of energy price stability, energy security and global climate impact issues.

The feed-in tariff is not meant to address the technical specifications for interconnection and power delivery. Sopogy understands the utility's need to address reliability and power quality issues and feels that clear technical interconnection requirements should be established by the utility and met by the project developer prior to grid connection.

HECO/Sopogy-IR-2
Do you agree that the HECO, MECO and HELCO systems have different technical and reliability considerations? If not, please discuss why not.

Response: Yes.

HECO/Sopogy -IR-3
Do you agree that due to the existing and/or anticipated levels of intermittent renewable resources on each island system, that there may be technical and/or operational constraints upon the amount of additional intermittent renewable energy that each island system can absorb? If not, please discuss why not.

Response: No. Technical and operational solutions are available for increasing renewables penetration on the grid. The burden should be on the utility to implement changes and upgrades to the grid transmission, distribution and storage capability that will allow for the achievement of the targeted levels of renewable penetration for each island, within the reasonable economic constraints that such solutions require.

HECO/Sopogy-IR-4
How does your FIT proposal insure that reliability and power quality on each island electric system are maintained?

Response: It is the utility's requirement, and not Sopogy's, to insure that the reliability and power quality is maintained on each island electric system. While project

developers using Sopogy technology are able to provide more reliable power via back-up fuels and thermal storage options (at a cost), the responsibility for addressing such grid-wide issues remains firmly at the utility level. The renewable energy producer simply has the obligation to meet the utility's stated technical interconnection requirements prior to connecting the system to the grid.

HECO/Sopogy-IR-5
What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures reliability on each island system? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

Response: As stated in IR-4 above, Sopogy firmly believes that it is the utility's responsibility, and not that of the project developer, to maintain the reliability of each island system. As such the data, evaluations, studies and analyses are the responsibility of the utility to generate and provide as inputs into this process.

HECO/Sopogy-IR-6
As variable generation is presently having an adverse impact on a system's reliability, how would your FIT proposal mitigate any further adverse impacts?

Response: It is Sopogy's position that it is not the project developer's responsibility to address overall grid reliability issues. See response to IR-4 and IR-5 above.

HECO/Sopogy-IR-7
Do you agree that your FIT proposal could result in increases in the rates paid by utility ratepayers? If so, what do you view as an acceptable level of increase for each of the utility system's ratepayers? What do you base that opinion on? Please provide any evaluations or analyses or studies used to support this opinion.

Response: It is possible that the FIT could result in somewhat higher prices to utility ratepayers in the short term. However, the FIT offers Hawaii a proven and viable economic path to achieve a level of renewable energy penetration required to meet the state's RPS goals. This provides a long term benefit to the ratepayers by providing a path toward price stability, energy security and reductions in harmful greenhouse gases. It is significant to note as an example the level of renewable generation achieved in Germany at a relatively low cost to German rate payers. The German feed-in tariff has achieved significant renewable electricity generation production over the past several years at a cost to German ratepayers of only about €.01/kWh.

HECO/Sopogy-IR-8
How does your FIT proposal insure that ratepayers within each of the three utility service territories do not receive significant rate increases?

Response: We do not believe there would likely be any significant rate increase due to the FiT program. Over time, as renewables replace fossil fuel generators, we would

anticipate (as supported by the initial HCEI economic impact analysis) that rates, and more importantly energy bills, would decrease.

As an example, the FIT in Germany resulted in installation of 14,000 MW of renewables at a cost of about €.01/kWh per residential customer. This would not appear to represent a significant rate increase.

HECO/Sopogy-IR-9
What specific data, evaluations, studies or analyses did you rely upon as a part of any conclusion that your FIT proposal insures that ratepayers within each of the three utility service territories do not receive significant rate increases? Please provide that data, evaluations, studies and/or analyses to the extent they are available.

Response: Sopogy does not have enough financial data to definitively state the case for rate structures across the three utility service areas. As mentioned in response to IR-8 above, however, Sopogy has looked at the success of feed-in tariff in Germany which has resulted in a cost of only about €.01/kWh per residential customer.

HECO/Sopogy-IR-10
Do you agree that competitive bidding can provide benefits to ratepayers? If so, how does your proposal insure that ratepayers receive the benefits that competitive bidding can provide?

Response: Yes, benefit can be derived from competitive bidding as well as an established FIT. However, FIT has been proven as a successful incentive for creating rapid installation of renewable energy systems through a transparent rate structure at a guaranteed term (in this case 20 years). This structure facilitates securing the project financing needed for such renewable systems. The benefits to the rate payers are long term as renewables become a greater proportion of the overall energy produced as it leads to long term price stability, energy security, and environmental benefits. Our FIT proposal does allow for the possibility of using competitive bidding for projects greater than 20 MW in size.

HECO/Sopogy-IR-11
Please explain why a feed in tariff should be applied to larger resources, rather than competitively bid to assure ratepayers the lowest prices for significant blocks of renewable energy?

Response: Sopogy is open to the idea of using competitive bidding for projects greater than 20 MW in size. However, for projects under 20 MW we firmly believe that the feed-in tariff, more so than competitive bidding, is a better mechanism for encouraging the rapid development of large-scale renewable energy generation at low cost to the public. Success in markets such as Germany and Spain provide compelling data for how a

properly crafted FIT can lead to rapid installation of renewable energy systems for a range of project sizes, both large and small.

HECO/Sopogy-IR-12
Do you agree that if a Renewable Energy Generating Facility is unable to meet the technical requirements set forth in the utilities' rules relating to interconnection with the utility's electric system, that Renewable Energy Generating Facility should not be interconnected with the utility's electric system? If not, please discuss why not.

Response: It is unclear what the specific technical requirements are being referred to in the above question. With respect to large scale wind and solar, Sopogy understands that technical requirements would be those currently in Rule 14 with possible modifications.

Sopogy's understanding of the technical requirements based on an alternative proposal, such as promulgated by Blue Plant, is as follows for customer-side ("retail") and utility-side ("wholesale") applications:

- Customer-Side: Projects must meet requirements as specified in utility Rule 14, as modified (TBD) for FiTs. For initial FiT implementation there would be no:
    - performance standard requirements (e.g., ramp rate restrictions),
    - fault ride-through requirements, and
    - utility control of individual projects up to 5 MW. Note: a cost adder will be negotiated, if utility control is required on larger projects.

- Utility-Side: Projects must meet basic interconnection requirements as specified in the utility "Rule XY," as developed in the instant docket. The basic Interconnection requirements (not including performance standards and fault-ride through capability) will be derived from existing power purchase agreements and modified (TBD). The new rule will include the following two options:
    - Utility Responsibility (Preferred Option): the utility designs and implements the necessary ancillary services to maintain grid safety and integrity. Ancillary services will include, but not be limited to: frequency regulation, voltage support, peak shaving, load shifting, black start capability and VAR support; and
    - Customer/Developer Responsibility (Back-Up Option): if ancillary services are required by the utility at the project level, the customer/developer will provide the necessary equipment and controls to smooth project output and to provide Fault Ride-Through Capability. Note: if this option is invoked the ancillary services will be paid for with an adder to the basic FiT payment.

HECO/Sopogy-IR-13
Do you agree that, as an electric system must remain in balance, if there is a greater amount of energy being generated in relation to load being served that generation must be reduced or curtailed to achieve system balance (assuming that load cannot be increased)? If not, please describe how the system balance can otherwise be achieved.

Response: Yes it is necessary to maintain the balance of the electric system. However the balance between generation and load is a separate issue that should not always require curtailment or reduction of renewable energy generation. Project level and grid level storage options, as well as other technical improvements to the grid, would allow for a greater penetration of renewables while still addressing system balance requirements. The utility, while working in partnership with industry and government, must take the lead in exploring and implementing promising options to maximize renewable penetration on the island grids to provide for Hawaii's secure energy future. Such options must be pursued above simple curtailment solutions that do not drive the state toward its renewable energy goals. Curtailment, if required, could also be of the utility generating assets instead of the renewable energy assets.

HECO/Sopogy-IR-14
Please explain how your proposal to require the utility to take all renewable energy generated by a FIT resource regardless of system need assures system balance and stability?

Response: Sopogy firmly believes that it is the utility's responsibility to maintain overall system balance and stability while also meeting RPS requirements for renewable energy penetration onto the grid.

HECO/Sopogy-IR-15
Is it your position that FIT resources may not be curtailed under any circumstance? If there are circumstances under which a FIT resource may be curtailed, please explain in detail how that curtailment would be accomplished. Please explain in detail how existing renewable projects fit into any curtailment order and the basis for assigning a lower curtailment priority to existing renewable resources.

Response: Yes. It is Sopogy's position that FIT resources should not be curtailed except in circumstances where the renewable resource is not available, in emergency situations, or when required for safety reasons.

HECO/Sopogy-IR-16
Please provide any evaluations, studies or analyses to support the following in your FIT proposal: (1) the inclusion of each renewable resource type; (2) the viability of each renewable resource type for each island system; (3) the project size demarcations for each renewable resource type; (4) the viability of each project size for each island

system; and (5) the basis for a different or separate rate for each size demarcation (if applicable). This should include any information or evidence that you may have on the general or specific plans of any renewable resource developer to develop renewable resources of this type, and including the anticipated size of the project, on any island system within the next one, three and five years.

Response: Sopogy's proposed FIT included support for the proposed approaches of other renewable energy providers (aside from CSP). This broad proposal was modeled after the German and Spain feed-in tariffs that has proven successful in encouraging the rapid development of large-scale renewable energy generation at low cost to the public.

The inclusion of each renewable resource type, the project size demarcations for each renewable resource type, and the basis for a different or separate rate for each size demarcation are supported by the following evaluations, studies and analyses showing the success of the same or similar resource types, project size demarcations and rates under the German FIT:

German Federal Environment Ministry, *Development of Renewable Energy Sources in Germany in 2007* (December 15, 2008)
http://www.bmu.de/files/pdfs/allgemein/application/pdf/ee_zahlen_2007_en_update.pdf

World Future Council, *Feed-In Tariffs – Boosting Energy for our Future* (June 2007)
http://www.hermannscheer.de/en/images/stories/pdf/WFC_Feed-in_Tariffs_jun07.pdf

European Photovoltaic Industry Association, *Supporting Solar Photovoltaic Electricity: An Argument for Feed-in Tariffs* (January 2008)
http://www.epia.org/fileadmin/EPIA_docs/documents/An_Argument_for_Feed-in_Tariffs.pdf

European Photovoltaic Industry Association, *European PV Association's Position Paper On A Feed-In Tariff For Photovoltaic Solar Electricity* (2005) http://www.wind-works.org/FeedLaws/EuropeFeedInTariffEPIA.pdf

European Photovoltaic Industry Association, *Overview of European PV support schemes* (December 17, 2008)
http://www.epia.org/fileadmin/EPIA_docs/documents/20081215_EPIA_EU_support_schemes_overview-PUBLIC.pdf

Paul Gipe, *Renewable Energy Policy Mechanisms* (February 17, 2006) http://www.wind-works.org/FeedLaws/RenewableEnergyPolicyMechanismsbyPaulGipe.pdf

Solar Electric Power Association, *Utility Procurement Study: Solar Electricity in the Utility Market* (December 2008)
http://www.solarelectricpower.org/docs/Procurement%20Report%20FINAL%20-%2012-16-08.pdf

Ministerio De Industria Turismo Y Comercio, 10556 REAL DECRETO 661/2007, de 25 de mayo, por el que se regula la actividad de produccion de energia electrica en regimen especial.
http://217.116.15.226/xml/disposiciones/min/disposicion.xml?id_disposicion=240846&desde=min

Ministerio De Industria Turismo Y Comercio, 15595 REAL DECRETO 1578//2008 de 26 de septiembre, de retribucion de la actividad de produccion de energia electrica mediante technologia solar fotovoltaica para instalaciones posteriors a la fecha limite de mantenimiento de la retrabucion del Real Decreto 661/2007, de 25 de mayo, para dicha technologia.
http://217.116.15.226/xml/disposiciones/min/disposicion.xml?id_disposicion=1318622&desde=min

The viability of each renewable resource type for each island and the viability of each project size for each island system are supported by the following evaluations, studies and analyses:

Douglas Hinrichs, *Feed-in Tariff Case Studies: A White Paper in Support of the Hawaii Clean Energy Initiative* (Sentech, Inc. September 2008).

Global Energy Concepts LLC, *A Catalog of Potential Sites for Renewable Energy in Hawaii* (Department of Business Economic Development and Tourism, December 2006) http://hawaii.gov/dbedt/info/energy/publications/epsre07.pdf

Global Energy Concepts LLC, *Select Hawaii Renewable Energy Project Cost and Performance Estimates, 2004* (Department of Business Economic development and Tourism 2004) http://hawaii.gov/dbedt/info/energy/publications/shrep04.pdf

Kearney & Associates, *Solar Electric Generating System (SEGS) Assessment for Hawaii: Final Report* (December 15, 1992). Prepared for the State of Hawaii Department of Business Economic Development and Tourism.

Hawaii Energy Policy Forum, *Interim Report on Renewables and Unconventional Energy in Hawaii* (November 2003). Prepared for the Hawaii Energy Policy Project University of Hawaii at Manoa.

HECO/Sopogy-IR-17
Please describe the methodology and rationale used to determine the proposed twenty (20) year terms in your FIT proposal for each technology. Please provide any evaluations, studies or analyses to support the proposed 20 years terms for each technology listed.

Response: The proposed twenty year term is based upon the models used in existing feed-in tariff markets in Europe such as Germany and Spain, as well as those found in Ontario and most recently in Gainesville, Florida. Additionally, renewable energy projects generally require a 15-20 year agreement in order to secure project financing

and to assure a reasonable rate of return for the project investors, which is why most renewable energy power purchase agreements are also between 15-25 years in length.

HECO/Sopogy-IR-18
Please provide the bases for the proposed penetration limits for intermittent renewable energy sources. Please provide any evaluations, studies or analyses to support the proposed penetration limits, including in particular any evaluations, studies or analyses regarding maintenance of system reliability at the proposed penetration limits.

Response: There may need to be ultimate limits on the penetration limits for certain resources, including intermittent renewable energy sources. However, at this point, Sopogy does believe we know if enough to specify these limits. Estimates have been made in wind and PV studies that suggest penetration limits of between 20-25% of peak demand. Not enough data is currently available to provide specific penetration levels for MicroCSP technology but it is expected to offer penetration levels higher than that of PV due to thermal buffering and the possible addition of thermal storage and boiler back up. Additionally, if the grid itself has sufficient storage and related ancillary services, there would be absolutely no need to limit intermittent resources for technical reasons. There would be limits, of course, at the time, if and when, there is no market for additional renewable electricity.

HECO/Sopogy-IR-19
Please explain in detail how the proposed queuing procedures based upon those procedures proposed by the Midwest ISO would operate and be implemented for each island electric system. In particular, please provide any evaluations, studies or analyses of potential differences between the Midwest ISO service territory and the Hawaii utility electric systems and how those differences would be accommodated and addressed through your FIT proposal. Please discuss in detail whether the quality of power (steadiness, predictability, ability to enhance regulating resources on the grid and other such characteristic that are important to power reliability) should be a factor in setting the priority a project receives, and if not, why not.

Response: Sopogy believes that the Midwest ISO could be implemented for each island electric system without signification modification. However, we are open to discussion on the merits of the Midwest ISO approach as well as exploring other options that may better address quality of power concerns.

HECO/Sopogy-IR-20
Should a utility be entitled to use the generated output of a renewable resource in its service territory toward meeting a state or county mandated RPS standard regardless of ownership of the environmental credits? If not, please discuss why not?

Response: Yes as renewable energy credits (RECs) are currently not required under state law. However, a change in this law should in turn require the utility to purchase

these RECs from the project owner in order to claim the "green" attributes of this power and count it towards meeting RPS requirements. This could most efficiently be done by raising the FIT rates to provide an acceptable purchase price for both the electricity generated as well as the "green" attributes of that power.

HECO/Sopogy-IR-21
Please provide any evaluations, studies, analyses or data to support the rates contained in your FIT proposal including detailed support for the applicability of those rates to the specified resources on the Hawaii utilities' island systems.

Response: Sopogy's proposed feed-in tariff rates, as listed in our opening statement of position, mirror the rates of PV for equivalent system sizes. See Sopogy's response to HECO/SOPOGY-IR-23 for reasoning for this FIT structure.

The proposed feed-in tariff rates for other renewable resources and renewable energy generating facilities were obtained from the feed-in tariff schedule in effect in Germany as of September 2008[1], converted from Euros into US Dollars at the exchange rate of €.6812:$1.0000 quoted as of September 23, 2008[2]:

Biomass: Wood-Burning Generating Facility
Biogas: Renewable Energy Generating Facility
Geothermal Energy: Renewable Energy Generating Facility
Landfill Gas or Sewage Treatment Gas: Renewable Energy Generating Facility
Hydropower: Renewable Energy Generating Facility
Wind: Offshore Wind Generating Facility
Wind: Onshore Wind Generating Facility

The proposed feed-in tariff rates for Biomass: Non-Wood Burning Generating Facility were furnished by Alexander & Baldwin/Hawaiian Commercial & Sugar Division.

The proposed feed-in tariff rates for Solar Radiation: Photovoltaic Generating Facility for each of the islands were furnished by The Solar Alliance, in consultation with Hawaii Solar Energy Association and Zero Emissions. These proposed rates represent good faith estimates of 20-year level feed-in tariff rates necessary to attract development capital for projects typical of the Electrical Capacity size ranges shown in Zero Emissions' Proposal for a Feed-in Tariff ("Zero Emissions FIT Proposal").

HECO/Sopogy-IR-22
Please explain how your proposed rates are affected by the key costs and operating characteristics referenced in the Commission's NRRI Scoping Paper filed December 11, 2008.

---

[1] The Germany feed-in tariff rates were obtained from the Tables of Renewable Tariffs or Feed-in Tariffs Worldwide published by Wind-Works org at http //www wind-works org/FeedLaws/ TableofRenewableTariffsorFeed-InTariffsWorldwide html

[2] Yahoo! Finance Currency Converter (September 23, 2008)

Response: The key costs and operating characteristics referenced in the Commission's NRRI Scoping Paper are relevant, but not determinative of the incentive FIT rate that attracts investment necessary to achieve rapid development of large-scale renewable energy generation at low cost to the public. Figures for these key costs and operating characteristics set a lower bound on the desired FIT rate, but do not account for risks, delays, legal and regulatory uncertainties, and the willingness or unwillingness of the utility and the Consumer Advocate to play by the rules. Investors have to take all such risks into account, and will take all such risks into account, in deciding whether to fund the development of renewable energy projects in Hawaii.

In addition to figures for these cost and operating characteristics, the Commission can and should ask the renewable energy industry participants for good faith estimates of the incentive FIT that would attract such development capital. Nobody will know, however, if the Commission got the FIT rate right until it is seen, after 2 to 3 years, how much renewable energy generating capacity has been called forth by the FIT rate.

HECO/Sopogy-IR-23 Ref: Paragraph 4

Please provide any evaluations, studies, analyses or data to support your request that the rates for solar technologies – both PV and CSP – be equivalent for each island and across the relevant project size ranges

Response: Given the recognized benefits of solar as an integral part of Hawaii's renewable energy mix and the potential additional benefits that MicroCSP can provide, our position is that equal FIT rates should be offered to encourage the installation of a variety of solar technologies in order to evaluate the best mix of solar generating assets for the various island grids.

Hawaii's environmental conditions do not provide a favorable environment for the "traditional" CSP technologies such as large scale parabolic trough, dish or power tower designs. Smaller scale solutions, called MicroCSP, do however offer the benefits of solar thermal electric systems while still being able to operate effectively in Hawaii's more demanding environment. While the "traditional" CSP systems have been around for decades and the basic technology is well understood, the economics of MicroCSP are still being validated based on the limited data available to date. While MicroCSP is based upon the same basic principles as CSP, the economics of these two technologies – based on design, scale and market segments – are not the same. As such, CSP economics should not be used as a method for devising MicroCSP costs and rates.

The scale of MicroCSP deployments are more in line with commercial and utility scale PV projects. As such, it makes more sense to utilize the PV rates for projects of similar system sizes. This will allow the deployment of MicroCSP alongside PV throughout the state in order to show the relative benefits of each technology in meeting the state's

overall RPS goals. MicroCSP does offer benefits over PV though such operating characteristics as smoother ramp up / ramp down, thermal buffering to "ride through" intermittency conditions, and cost effective storage to shift or extend power delivery beyond the solar day. MicroCSP can also be supplemented with a boiler to provide firm or scheduled power to the grid. In the future, rate structures regarding PV and CSP can be reevaluated as more MicroCSP and PV systems are deployed throughout the state and the economic costs are benefits are better understood. In the meantime, Sopogy believes that it is best to not favor one solar technology over another within the FIT structure.

Responses by Sopogy to IRs of DBEDT

DBEDT/SOPOGY-IR-1

Please provide all the workpapers and data used to determine the proposed feed-in tariff rates in the referenced pages.

Response: Sopogy's proposed feed-in tariff rates, as listed in our opening statement of position, mirror the rates of PV for equivalent system sizes. See Sopogy's response to HECO/SOPOGY-IR-23 for reasoning for this FIT structure.

The proposed feed-in tariff rates for other renewable resources and renewable energy generating facilities were obtained from the feed-in tariff schedule in effect in Germany as of September 2008[3], converted from Euros into US Dollars at the exchange rate of €.6812:$1.0000 quoted as of September 23, 2008[4]:

Biomass: Wood-Burning Generating Facility
Biogas: Renewable Energy Generating Facility
Geothermal Energy: Renewable Energy Generating Facility
Landfill Gas or Sewage Treatment Gas: Renewable Energy Generating Facility
Hydropower: Renewable Energy Generating Facility
Wind: Offshore Wind Generating Facility
Wind: Onshore Wind Generating Facility

The proposed feed-in tariff rates for Biomass: Non-Wood Burning Generating Facility were furnished by Alexander & Baldwin/Hawaiian Commercial & Sugar Division.

The proposed feed-in tariff rates for Solar Radiation: Photovoltaic Generating Facility for each of the islands were furnished by The Solar Alliance, in consultation with Hawaii Solar Energy Association and Zero Emissions. These proposed rates represent good faith estimates of 20-year level feed-in tariff rates necessary to attract development capital for projects typical of the Electrical Capacity size ranges shown in Zero Emissions' Proposal for a Feed-in Tariff ("Zero Emissions FIT Proposal").

HECO/SOPOGY-IR-16 (above) lists additional resources used in this analysis.

[3] The Germany feed-in tariff rates were obtained from the Tables of Renewable Tariffs or Feed-in Tariffs Worldwide published by Wind-Works org at http //www wind-works org/FeedLaws/ TableofRenewableTariffsorFeed-InTariffsWorldwide html

[4] Yahoo! Finance Currency Converter (September 23, 2008).

CERTIFICATE OF SERVICE

The foregoing SOPOGY Response was served on the date of filing by Hand Delivery or electronically transmitted to each such Party as follows.

CATHERINE P. AWAKUNI EXECUTIVE DIRECTOR DEPT OF COMMERCE & CONSUMER AFFAIRS DIVISION OF CONSUMER ADVOCACY P O. Box 541 Honolulu, Hawaii 96809	2 Copies Via Hand Delivery
DEAN MATSUURA MANAGER REGULATORY AFFAIRS HAWAIIAN ELECTRIC COMPANY, INC. P O. Box 2750 Honolulu, HI 96840-0001	Electronically transmitted
JAY IGNACIO PRESIDENT HAWAII ELECTRIC LIGHT COMPANY, INC. P. O. Box 1027 Hilo, HI 96721-1027	Electronically transmitted
EDWARD L. REINHARDT PRESIDENT MAUI ELECTRIC COMPANY, LTD. P. O. Box 398 Kahului, HI 96732	Electronically transmitted
THOMAS W. WILLIAMS, JR., ESQ. PETER Y. KIKUTA, ESQ. DAMON L. SCHMIDT, ESQ. GOODSILL, ANDERSON QUINN & STIFEL Alii Place, Suite 1800 1099 Alakea Street Honolulu, Hawaii 96813	Electronically transmitted
ROD S. AOKI, ESQ. ALCANTAR & KAHL LLP 120 Montgomery Street Suite 2200 San Francisco, CA 94104	Electronically transmitted
MARK J. BENNETT, ESQ. DEBORAH DAY EMERSON, ESQ. GREGG J. KINKLEY, ESQ. DEPARTMENT OF THE ATTORNEY GENERAL 425 Queen Street Honolulu, Hawaii 96813 Counsel for DBEDT	Electronically transmitted

CARRIE K.S. OKINAGA, ESQ.
GORDON D. NELSON, ESQ.
DEPARTMENT OF THE CORPORATION COUNSEL
CITY AND COUNTY OF HONOLULU
530 South King Street, Room 110
Honolulu, Hawaii 96813

Electronically transmitted

LINCOLN S.T. ASHIDA, ESQ.
WILLIAM V. BRILHANTE JR., ESQ.
MICHAEL J. UDOVIC, ESQ.
DEPARTMENT OF THE CORPORATION COUNSEL
COUNTY OF HAWAII
101 Aupuni Street, Suite 325
Hilo, Hawaii 96720

Electronically transmitted

MR. RILEY SAITO
THE SOLAR ALLIANCE
73-1294 Awakea Street
Kailua-Kona, Hawaii 96740

Electronically transmitted

MR. CARL FREEDMAN
HAIKU DESIGN & ANALYSIS
4234 Hana Highway
Haiku, Hawaii 96708

Electronically transmitted

MR. THEODORE E. ROBERTS
SEMPRA GENERATION
101 Ash Street, HQ 12
San Diego, California 92101

Electronically transmitted

MR. ERIK KVAM
CHIEF EXECUTIVE OFFICER
ZERO EMISSIONS LEASING LLC
2800 Woodlawn Drive, Suite 131
Honolulu, Hawaii 96822

Electronically transmitted

WARREN S. BOLLMEIER II, PRESIDENT
HAWAII RENEWABLE ENERGY ALLIANCE
46-040 Konane Place 3816
Kaneohe, HI 96744

Electronically transmitted

GERALD A. SUMIDA, ESQ.
TIM LUI-KWAN, ESQ.
NATHAN C. NELSON, ESQ.
CARLSMITH BALL LLP
ASB Tower, Suite 2200
1001 Bishop Street
Honolulu, Hawaii 96813
Counsel for HAWAII HOLDINGS, LLC, dba FIRST WIND HAWAII

Electronically transmitted

MR. CHRIS MENTZEL
CHIEF EXECUTIVE OFFICER
CLEAN ENERGY MAUI LLC
619 Kupulau Drive
Kihei, Hawaii 96753

Electronically transmitted

DATED: Honolulu, Hawaii, March 13, 2009